NATIONAL MARROW DONOR PROGRAM®

Entrusted to operate the C.W. Bill Young Cell Transplantation Program,
including Be The Match Registry℠

April 30, 2010

LCDR Sheri Parker
Office of Naval Research (ONR 342)
875 N. Randolph St.
Arlington, VA 22203-1995

Subject: **Quarterly Performance/Technical Report of the National Marrow Donor Program®**

Reference: Grant Award #N00014-08-1-1207 between the Office of Naval Research and the National Marrow Donor Program

Dear Cdr. Montcalm-Smith:

Enclosed is subject document which provides the performance activity for each statement of work task item of the above reference for the period of January 1, 2010 to March 31, 2010.

Should you have any questions as to the scientific content of the tasks and the performance activity of this progress report, you may contact our Chief Medical Officer – Dennis L Confer, MD directly at 612-362-3425.

With this submittal of the quarterly progress report, the National Marrow Donor Program has satisfied the reporting requirements of the above reference for quarterly documentation. Other such quarterly documentation has been previously submitted under separate cover.

Please direct any questions pertaining to the cooperative agreement to my attention (612-362-3403 or at cabler@nmdp.org).

Sincerely,

Carla Abler-Erickson

Carla Abler-Erickson, MA
Sr. Contracts Representative

Enclosure: Quarterly Report with SF298

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14. ABSTRACT

1. Contingency Prepardness: Collect information from transplant centers, build awareness of the Transplant Center Contingency Planning Committee and educate the transplant community about the critical importance of establishing a nationwide contingency response plan.

2. Rapid Identification of Matched Donors : Increase operational efficiencies that accelerate the search process and increase patient access are key to preparedness in a contingency event.

3. Immunogenetic Studies: Increase understanding of the immunologic factors important in HSC transplantation.

4. Clinical Research in Transplantation: Create a platform that facilitates multicenter collaboration and data management.

15. SUBJECT TERMS
Research in HLA Typing, Hematopoietic Stem Cell Transplantation and Clinical Studies to Improve Outcomes

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NATIONAL MARROW DONOR PROGRAM®

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Grant Award N00014-08-1-1207

QUARTERLY
PERFORMANCE / TECHNICAL REPORT
FOR
JANUARY 01, 2010 to MARCH 31, 2010
PERIOD 6

Office of Naval Research

And

The National Marrow Donor Program
3001 Broadway Street N.E.
Minneapolis, MN 55413
1-800-526-7809

QUARTER PROGRESS REPORT

Development of Medical Technology for Contingency Response to Marrow Toxic Agents

January 01, 2010 through March 31, 2010

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IIA. Contingency Preparedness – Objective 1: Recovery of casualties with significant myelosuppression following radiation or chemical exposure is optimal when care plans are designed and implemented by transplant physicians	
IIA.1.1 Task 1: Secure Interest of Transplant Physicians	**Period 6 Activity:** • Since its' creation in 2006 – 2,036 RITN center staff have successfully completed Basic Radiation Training; this is a passing rate of 96%
IIA.1.2 Task 2: GCSF in Radiation Exposure	**Period 6 Activity:** • No activity this period.
IIA.1 3 Task 3: Patient Assessment Guidelines and System Enhancements	**Period 6 Activity:** **STAR Link Web and Do It Yourself (DIY)** application efforts were focused on required features and enhancements to support a contingency event. This work enables the ability to electronically contact the donors via email and allows them to update their contact information and complete a Health History Questionnaire (HHQ) from the DIY online platform. Information provided by the donor is securely transferred to the donor's record in STAR Link facilitating reporting, storage and review of this information in established donor management systems. Project Outcomes**,** related to the new versions of the STARLink Web and Do It Yourself Donor (DIY) applications, continue to show favorable results and strong user feedback: • Donors continue to be responsive to online tools. New Online Health History Questionnaire functionality resulted in: o 2852 **"Completed"** HHQs o 206 "**in process"** HHQs between 10/1/09 – 03/31/10 • An overall time savings of **641** hours for completed HHQs due to the 50% reduction in processing time per Online HHQ. Work continues on the 2nd Release - creating an Event Portal Workflow Management Application to manage contingency events, initially for preliminary search events:

- All development and testing was completed
- Will be delivered into Production as a pilot application early April 2010 with General Production Release scheduled for June 2010.

Key features included are the:

- ability to track preliminary event donors in a central screen, for purposes of donor management.
- ability to import the preliminary event donors, as identified through the preliminary event daily report
- ability to export the preliminary event donors for purpose of supporting address validations, manual mail merges or automated letter merges

Deployment Strategy will include:

- Conducting a Pilot for the Event Portal
  - Timeline is from 4/1/10 – 6/1/10
  - Includes the NMDP Call Back Unit and 3 Donor Centers
  - Key Metrics will be captured to measure the:
    1. Volume of donors contacted and response rate
    2. Processing time to contact donors and receive updated information
    3. Percentage of donors available at subsequent search stage
- General Release of Event Portal
  - Timeline is for June 2010
  - Will be available to all Domestic NMDP Network Donor Centers, excluding the DoD and DKMS Americas
  - Overall feedback and processing Metrics will be captured

Adding the Event Portal Workflow Management functionality will continue to add to the productivity gains of donors screened using this method. It is expected that NMDP will gain:

- The ability to scale for a contingency event requiring confirmation of the availability and suitability of a large number of donors

IIA 1.4 Task 4: National Data Collection Model	**Period 6 Activity:** • No activity this period
IIA. Contingency Preparedness – Objective 2: Coordination of the care of casualties who will require hematopoietic support will be essential in a contingency situation.	
IIA.2.1 Task 1: Contingency Response Network	**Period 6 Activity:** • Completed the development of the 2010 RITN Tabletop Exercise and distributed it to all RITN centers. • Distributed FY10 RITN participation agreements to all 56 centers and formally invited one (1) additional transplant center to participate in RITN (Rush-Presbyterian/St. Luke's Medical Center in Chicago, IL); this center has exhibited keen interest in joining RITNs preparedness activities. • Evaluator Exchange Program: o Continued to plan for and coordinate the Evaluator Exchange Program, where RITN transplant centers will evaluate each others preparedness level. o Checklists are completed and are currently being circulated to a select group of RITN transplant centers as a final review to ensure the highest quality product and result. o Training for the evaluators is under development to ensure consistency and benefit from the activity. • Conducted three (3) Monthly RITN Conference Calls for center contacts to discuss issues related to the completion of tasks at their centers with the intent of sharing best practices between centers. • Created and distributed three (3) “Radiation In the News” radiation event summary reports for distribution to RITN center staff to keep them abreast of radiological related incidents occurring around the globe. • Staff attended as an observer one (1) tabletop exercise conducted by the University of Minnesota Medical Center, Fairview RITN center. Six (6) additional visits are anticipated for this performance period.

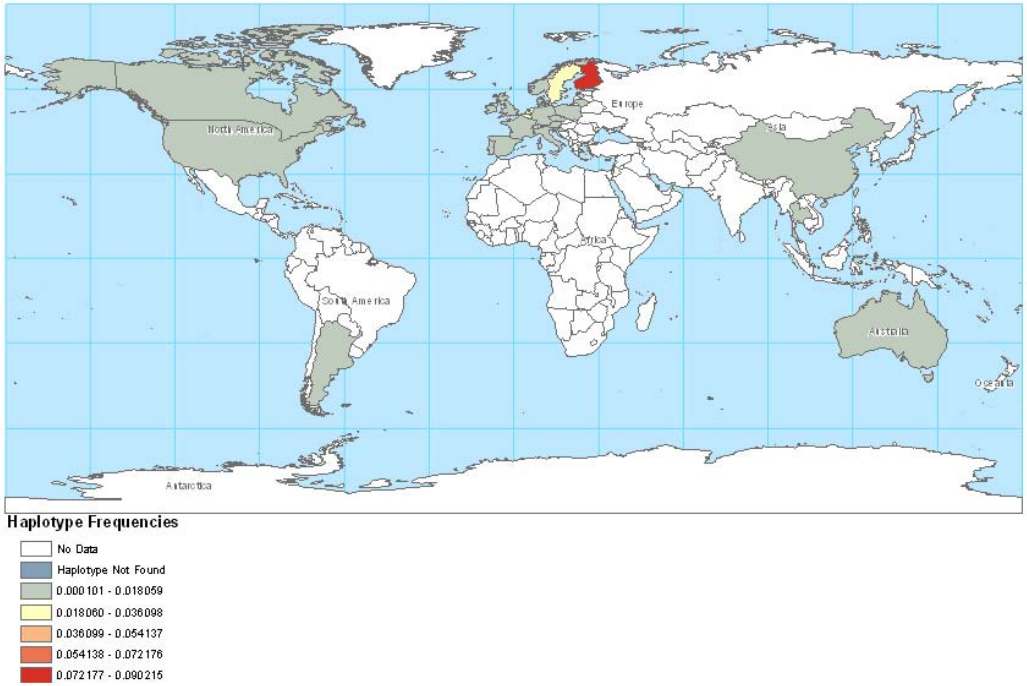
IIA.2.2 Task 2: Sibling Typing Standard Operating Procedures	**Period 6 Activity:** • Discussed direction for documentation of interim related typing process.
IIA. Contingency Preparedness – Objective 3: NMDP's critical information technology infrastructure must remain operational during contingency situations that directly affect the Coordinating Center.	
IIA.3.1 Task 1: I.S. Disaster Recovery	**Period 6 Activity:** • There were no significant modifications or changes to the Disaster Recovery Systems or Plan during this period. Routine maintenance was performed.
IIA.3.2 Task 2: Critical Facility and Staff Related Functions	**Period 6 Activity:** • **Business Continuity Planning:** o Continued to distribute to all new staff the "NMDP Flu Fighter" training on reducing the spread of influenza in the workplace; 89% of NMDP staff have completed the training o Emergency communications drills conducted: ▪ We were able to reach 91% of NMDP staff using the mass telephone Emergency Notification System (ENS) ▪ 78% of RITN centers successfully tested the use of their satellite telephone ▪ Successfully tested the NMDP Headquarters public address system ▪ 90% of the NMDPs Network of centers (382 of 423 centers) responded to an emergency notification email with-in 24 hours o Coordinated the department development of appropriate detailed tasks to be tested at a remote (non-NMDP controlled) location for the 2010 Business Continuity Exercise. o Business Continuity Plan Critical Task List update: ▪ Completed the semi-annual update and review of critical tasks (92% of business units are updated). ▪ Realigned Task List to mirror changes in NMDP organizational structure.

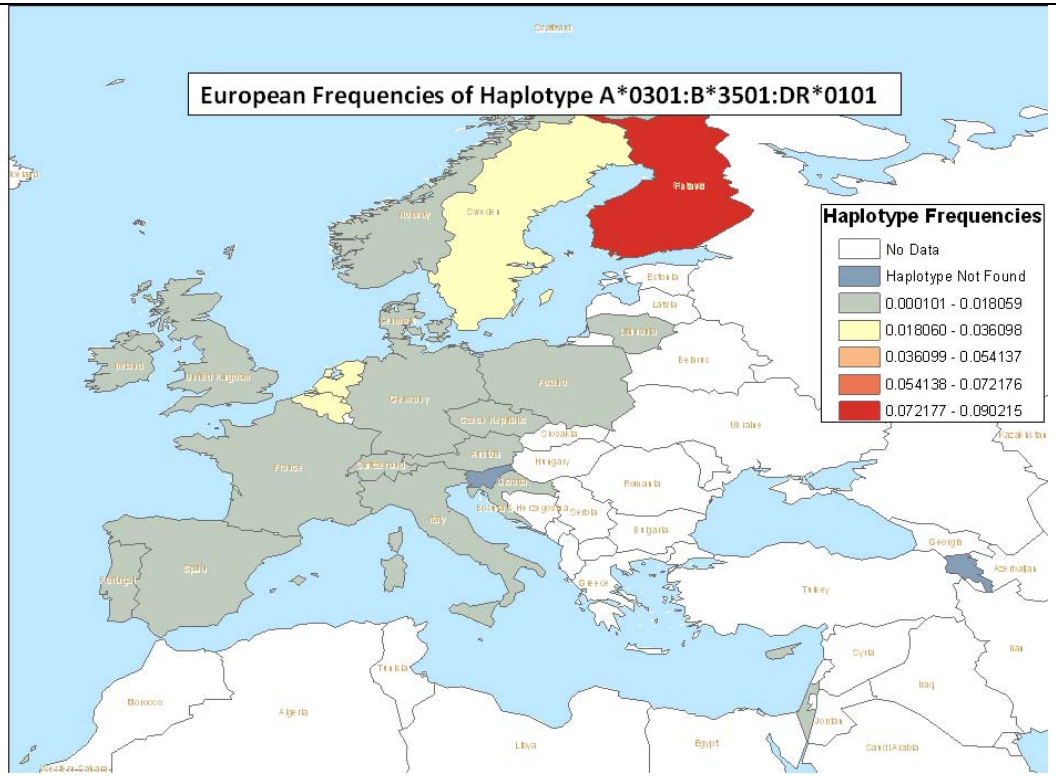
IIB. Rapid Identification of Matched Donors – Objective 1: Increasing the resolution and quality of the HLA testing of volunteers on the registry will speed donor selection.	
IIB.1.1 Task 1: Increase Registry Diversity	**Period 6 Activity:** The NMDP maintains lists of rare alleles as a service to the American Society for Histocompatibility & Immunogenetics (ASHI). These lists are derived from HLA allele level typings of patients, adult volunteers, and cord blood units in the NMDP Registry. Careful review of the rare alleles reported to the NMDP on adult volunteer samples revealed typings that were suspicious and may have been incorrectly reported due to various reasons including: • Typing methodologies used to report the rare allele were problematic resulting in a correction of some of the rare allele results. • Rare allele was typed more than 4 years ago and the allele has not been reported since. • Presence of two rare alleles in a donor typing. • Primary data interpretation doesn't match the rare allele reported. • Rare allele was typed on the same day in more than one sample reported from a lab Laboratories currently under contract with the NMDP were asked to review their typing for rare alleles that were reported within 5 years. 111 reported rare alleles were corrected and 59 were confirmed by this process. In addition, TC reported results were examined for clerical errors with 11 results corrected following review of the Form 22. There were many questionable results that had type dates older than 5 years or where contact with the laboratory was not possible. In March, 2010, 117 samples were sent to a contract laboratory for high resolution typing at A, B, or DRB1. After retyping, 111 results (96%) changed from the previously reported rare allele.
IIB.1.2 Task 2: Evaluate HLA-DRB1 High Res typing	**Period 6 Activity:** • This activity is closed.
IIB.1.3 Task 3: Evaluate HLA-C Typing of Donors	**Period 6 Activity:** • This activity is closed.

IIB.1.4 Task 4: Evaluate Buccal Swabs	**Period 6 Activity:** • No activity this period.
IIB 1.5 Task 5: Enhancing HLA Data for Selected Donors	**Period 6 Activity:** This aim consists of registry-based typing projects, which have the potential to strategically identify and improve the HLA typing and availability of donors most likely to match searching patients from domestic TCs. All strategies being evaluated are extensions of the previous Back-up Donor and Optimal Donor typing projects. • In previous reporting periods, 690 U.S. donors were selected from the HLA-AB only typed pool and HLA typing upgraded to intermediate-high resolution HLA-A, B, C, DRB1. Prospective typing was completed in April 2009. Follow-up of prospectively typed donors revealed the selection of 12 donors for CT requests on behalf of 11 different patients. The activated donors had been on the registry from 9 -12.7 years prior to selection for HLA typing upgrade through the project. The donors were activated for new patients within an average of 215 days from the date upgraded HLA typing results were available to searching patients. Two of the twelve donors have gone on to donate a stem cell product for a patient. One donor was a 10/10 allele match with the patient, and the second was a 9/10 allele match (HLA-C allele mismatch) with the patient. In previous reporting periods we performed an additional 565 donor selections for prospective HLA typing using our Optimal Donor selection strategies. Follow-up of these prospectively typed donors, revealed the selection of 14 donors for CT requests on behalf of 9 different patients. Two of these donors currently have active Work-Up requests. The activated donors had been on the registry from 0.7 - 10.2 years prior to selection for HLA typing upgrade through the project. The donors were activated for new patients within an average of 210 days from the date upgraded HLA typing was made available. 13 of the 565 prospectively typed donors were requested within the first 315 days. • These donor utilization rates (12 out of 690 and 13 out of 565) each represent more than **5 fold increases** over random selection rates and demonstrates the ability to strategically identify donors most likely to be needed for future searching patients.

IIB 1.6 Task 6: Maintain a Quality Control Program	**Period 6 Activity:** • No activity this period.
IIB. Rapid Identification of Matched Donors – Objective 2: Primary DNA typing data can be used within the registry to improve the quality and resolution of volunteer donor HLA assignments.	
IIB 2.1 Task 1: Collection of Primary Data	**Period 6 Activity:** • Continued the efforts to validate probe results making them available to systems using HapLogic. Primary probe data from donors in the registry prior to February 2007 had already been validated and are used for searches; with this quarter's effort all primary data from donors typed through November, 2008 have been validated and are available for use in searches. • Began work on designing a process for real-time interpretation of primary data.
IIB 2.2 Task 2: Validation of Logic of Primary Data	**Period 6 Activity:** • This activity is closed.
IIB 2.3 Task 3: Reinterpretation of Primary Data	**Period 6 Activity:** • This activity is closed.
IIB 2.4 Task 4: Genotype Lists & Matching Algorithm	**Period 6 Activity:** • Tested SBT interpretation code on two HML files from a contract lab, one with class I data and one with class II data. Able to interpret all the samples from the class I file, however we are waiting to receive the amplification primers used so that we can determine which alleles to rule out in the case of a null sequence. • Tested SBT interpretation code on HML files from another contract lab that had 22 haploid samples, which required different processing from diploid samples. Able to interpret all but two of the samples in the file that were missing SBT sequences.

IIB. Rapid Identification of Matched Donors – Objective 3: Registry data on HLA allele and haplotype frequencies and on the nuances of HLA typing can be used to design computer algorithms to predict the best matched donor.	
IIB.3.1 Task 1: Phase I of EM Haplotype Logic	**Period 6 Activity:** • Hired a dedicated business systems analyst for HapLogic Phase III. • Began writing detailed requirements for the HapLogic Phase III algorithm.
IIB 3.2 Task 2: Enhancement of EM Algorithm	**Period 6 Activity:** • A greedy algorithm to create a reduced allele list and EM bootstrapping was implemented for multiple allele code data to reduce HLA ambiguity and make possible haplotype frequency computation using mixed resolution data for BMDW. • Haplotype frequencies for all BMDW registries with typing by DNA methods have been completed and will be incorporated into a global matching benchmark and maps of worldwide HLA diversity. • Frequency study of donors typed to distinguish some HLA alleles that differ only outside the Antigen Recognition Site (ARS) was completed.
IIB 3.3 Task 3: Optimal Registry Size Analysis	**Period 6 Activity:** • Report titled "Modeling effective patient-donor matching hematopoietic transplantation in United States populations" was completed on January 15th. • Basic modeling for cost-benefit analysis comparing adult donor versus cord recruitment has begun. More complex and race-specific cost-benefit models are in development. • A simulation study of cord inventory depletion was undertaken showing that after depletion the remaining large cords in inventory will show enrichment for rare HLA types.

IIB 3.4 Task 4: Target Under- Repre-sented Phenotypes	**Period 6 Activity:** • Using the EM algorithm, haplotype frequencies were determined from individual registries in the BMDW database. Data from the top 200 haplotypes, by frequency, are being consolidated on a country basis and then globally mapped. Maps give an indication of where donors or patients with specific haplotypes are most likely to be found on a world-wide basis. Below are examples maps of haplotype A*0301:B*3501:DRB1*0101, a haplotype with an apparent geographical center of origin in or near Finland. **Global Frequencies of Haplotype A*0301:B*3501:DR*0101 By Country** 

	
IIB 3.5 Task 5: Bioinformatics Web Site	**Period 6 Activity:** • This activity is closed.
IIB 3.6 Task 6: Consultants to Improve Algorithm	**Period 6 Activity:** • This activity is closed.
IIB 3.7 Task 7: Population Genetics	**Period 6 Activity:** • No activity this period.

IIB 3.8 Task 8: Haplotype Matching	**Period 6 Activity:** • No activity this period.
IIB 3.9 Task 9: Global Haplotype/Benchmark	**Period 6 Activity:** • No activity this period.
IIB. Rapid Identification of Matched Donors – Objective 4: Reducing the time and effort required to identify closely matched donors for patients in urgent need of HSC transplants will improve access to transplantation and patient survival in the context of a contingency response and routine patient care.	
IIB.4.1 Task 1: Expand Network Communications	**Period 6 Activity:** Implemented the Business to Business (B2B) Gateway and Business Services to support : • Incoming HLA typing results incorporating HLA Nomenclature changes • Inventory Integration from affiliated business entities (i.e. EMDIS) • The implementation of HLA Override as a business service intended to validate and audit all HLA results received • The formalization of pathways through which data are transmitted to NMDP from affiliates • The development of the underlying capabilities to support the Version 3 IMGT Nomenclature requirements
IIB.4.2 Task 2: Central Contingency Management	**Period 6 Activity:** **Medical Education Series on AML and MDS launched and is now online** • The educational program, *Navigating the Therapeutic Pathways for AML and MDS*, is now online and will remain active for CME (Continuing Medical Education) credits for one year. The goal of the program is to improve the application of transplantation, particularly the timing of referral, for patients with Acute Myelogenous Leukemia (AML) and Myelodysplastic Syndrome (MDS). The program is available online at www.marrow.org/md-cme and through an online education partner, Clinical Care Options. Within the first 10 days of launch the program had already been viewed by more than 900 clinicians.

	Donor Testing • Donor testing continued for a research project to validate the "actual" HLA-A, B, C and DRB1(8/8) high resolution match rates for both CAU and AFA patients and supply valuable information regarding donor selection in the event of a contingency. Donors are being tested in rounds of priority for cost efficiency. Five rounds of donor testing were performed in this period (N=325 loci total) and results compiled for the analysis. Additional testing rounds will continue next quarter to complete the analysis.
IIB.4.3 Task 2: Benchmarking Analysis	**Period 6 Activity:** • This activity is closed.
IIB.4.4 Task 2: Expand Capabilities of Collection and Apheresis Centers	**Period 6 Activity:** • This activity is closed.
IIC. Immunogenetic Studies – Objective 1: HLA mismatches may differ in their impact on transplant outcome, therefore, it is important to identify and quantify the influence of specific HLA mismatches. In contingency situations it will not be possible to delay transplant until a perfectly matched donor can be found.	
IIC.1.1 Task 1: Donor Recipient Pair Project	**Period 6 Activity:** In 1994 a retrospective D/R Pair HLA typing project to characterize class I and class II alleles of donor/recipient paired samples from NMDP's Repository was initiated. The goals of this ongoing research project are to assay the impact of DNA-based HLA matching on unrelated donor transplant outcome, develop strategies for optimal HLA matching, evaluate the impact of matching at alternative HLA loci on transplant outcome and finally to promote the development of DNA-based high resolution HLA typing methodologies. • 97% of Sample Group (SG) 24 pairs, testing completed December 31, 2009, were audited and made available for inclusion in research studies. • The project period for SG 25 will come to a close on April 30, 2010. • A special sample shipment was distributed to complete HLA-DPB1 testing on a cohort of

	transplants for non-malignant disease in support of an ongoing CIBMTR IBWC study led by Ann Woolfrey on behalf of the NMDP Histocompatibility Advisory Group. Results are due on May 31, 2010. • Preparation of SG 26 has been initiated. The period of performance for SG 26 will be from April 30, 2010 to August 31, 2010. Current HLA matching guidelines for unrelated HCT recommend avoidance of mismatches only within the Antigen Binding Domain (ABD). This recommendation is based on the hypothesis that amino acid differences outside the ABD are not immunogenic. The ABD allo-reactivity assessment project will give insight into the allowable percent tolerance of matching needed outside of the ABD. • Completed queries of the Be The Match Registry to identify a specific non-ABD mismatch (DRB1*140101/1454) where both alleles have been seen in the same genotype.
IIC. Immunogenetic Studies – Objective 2: Even when patient and donor are HLA matched, GVHD occurs so other loci may play a role.	
IIC 2.1 Task 1: Analysis of non-HLA loci	**Period 6 Activity:** **Immunobiology Project Results (IPR)** The IPR database and its applications will allow for storage and analysis of all immunogenetic data collected on NMDP research samples. This database will replace the existing HLA donor/recipient pair's database and facilitate storage and analysis of data from other immunogenetic loci (KIR, microsatellites, single nucleotide polymorphisms, etc). • The Scientific Services and Bioinformatics departments continued to collaborate on the design and development of the IPR database application and tools. • User-acceptance testing (UAT) was conducted on the application that accepts, validates, and stores incoming HLA and KIR typing data via HML. A few deficiencies were noted and are being corrected. Deployment to production is planned in early April; preparation for this move is in progress. • Quality assurance was performed and corrections completed on reports that support the business user's ability to track typing requests and their results.

	• Quality assurance and corrections were done on an application which loads transplant center typings. • Quality assurance was completed on an application that compares typings between the labs and the transplant centers. UAT was begun; correction of deficiencies noted is underway. • Quality assurance was initiated and corrections initiated on software tools that monitor and resolve typing discrepancies. UAT was begun; correction of deficiencies noted is underway. • Development was initiated on software tools that allow the business user to monitor, alter, and audit data. • Quality assurance continued on software that automates the processing flow of the data from loading to data analysis to comparison between the labs to auditing to selection for study. **Killer Immunoglobulin-like Receptor (KIR)** In 2005 a pilot study to perform high resolution KIR gene typing was launched. The primary objectives of the study were to move technology forward from the current practice of locus level typing to high resolution typing, disseminate information and protocols in an open source mechanism and develop reference lines for use in individual laboratories. • Typing of 78 potential news alleles produced a total of 46 novel alleles. All sequences were submitted and names received for all loci. A publication is in development to describe the new alleles. • Preparation continued on the KIR Typing Project manuscript. • To date 1900 pairs from the Donor/Recipient pair's project have been typed for presence/absence of 14 KIR loci (2DL1-5, 2DS1-5, 3DL1-3 and 3DS1) and another 400 pairs have been enrolled. • Discrepancy analysis of the KIR presence/absence typing on samples from SG24 was completed.
IIC 2.2 Task 2: Related Pairs Research Repository	**Period 6 Activity:** • No activity this period.

IIC 2.3 Task 3: CIBMTR Integration	**Period 6 Activity:** • No activity this period.
IID. Clinical Research in Transplantation – Objective 1: Clinical research in transplantation improves transplant outcomes and supports preparedness for a contingency response.	
IID.1.1 Task 1: Observational Research, Clinical Trials and NIH Transplant Center	**Period 6 Activity:** **AGNIS Activity:** • Completed user acceptance testing of AGNIS 2.0 Publish and Retrieve functionality with external vendor Stemsoft. Released AGNIS 2.0 Publish and Retrieve functionality to production. Implemented an approach to allow re-publish of previously completed forms. Re-published all previously completed TED, pre-TED, and Death forms into the AGNIS 2.0 repository. • Established processes to authorize transplant center retrieval of completed forms through AGNIS 2.0. • Released form 2005 (HLA) revision 1 to external development for submission by transplant centers. • Completed curation of revision 2 of mandated forms: TED, Pre-TED, HLA, IDM, and Infusion. Began development and QA for submission of revision 2 of TED and pre-TED forms. • Complete development and began unit test and documentation for AGNIS Enhanced Staging Client, a tool to support transplant center submission and retrieval of forms through AGNIS. • Roswell Park Cancer Institute resource no longer available, met with Duke University regarding use of AGNIS Enhanced Staging Client in a beta site capacity. • Mayo clinic and University of Wisconsin have initiated projects to implement AGNIS. Met with the University of Pennsylvania and Duke University, they are considering AGNIS projects. • Completed mapping of EBMT forms to CIBMTR/SCTOD Death form. Began mapping of EBMT forms to TED and pre-TED forms.

FormsNet Activity

- The following items were deployed during this quarter:

Deployed	Description
1/4/2010	FN2.9.1, 2.10 and 2.11 (Clinical Trials functionality, Recipient/Donor enhancements and 26 form revisions)
1/5/2010	AGNIS 1.2.2
1/14/2010	MRW 1.0 FN Management Reporting Website moves to production with 6 new reports
1/19/2010	FormsNet2.10.1 Service Pack 1
1/20/2010	AGNIS Translator 1.2.2.1 Patch for F2004/F2005
1/21/2010	AGNIS Publisher 2.0
1/21/2010	Emergency FN2 patch for E&A logging web service
1/22/2010	FN-Finance Sync
2/1/2010	MRW 1.1 Additional reports
2/1/2010	FormsNet2.10.1.2 patch
2/15/2010	AGNIS Publisher 2.1
3/9/2010	FormsNet2.11.1 Clinical Trials, Recipient, Donor Enhancements
3/10/2010	AGNIS Translator 1.2.2.2 upgrades related to FormsNet Releases
3/11/2010	MRW 1.2 Additional reports
3/15/2010	FN2.11.1.1 - Emergency patch for F2100+F2200R1
3/15/2010	AGNIS Translator 1.2.2.3 EMERGENCY w/FN2.11.1.1 patch
3/25/2010	Emergency fix for FN2 Database Contention on Form Saves

Cord Blood Research

- The challenge grant application to the NHLBI to support a study to investigate biomarkers associated with cord blood engraftment was not awarded. The study protocol was re-evaluated and revised to allow the study to proceed with ONR support.

- The Duke and MD Anderson laboratory staff continued work on validating the assay methodologies to ensure consistent results were generated at both testing sites for the study investigating biomarkers associated with cord blood engraftment. The study will proceed upon statistical verification of the validation testing results.

- Work continued on the observational study of single versus double cord blood transplants in adults. Further analyses were requested and completed. The principal investigator, EJ Shpall, MD, presented the results to the Graft Sources Working Committee at the 2010 Tandem Meeting. Suggestions from the committee will be incorporated into the analysis and a manuscript prepared.
- An updated analysis plan and study design to evaluate the impact of non-inherited maternal antigen mismatching in cord blood transplantation was presented to the IBWC at the 2010 Tandem Meeting. Maternal samples will be collected from participating CBBs and tested during the next quarter.
- Work continued on the development of a white paper detailing recommendations/guidelines for the assessment of new assays (potency or other assays) relevant to cord blood banking and/or transplantation. The final draft of the paper will be completed for review at the June 2010 Cord Blood Committee meeting.
- The cord blood race matching analysis was refreshed and the population size increased to 4,065 consecutive NMDP distributed CBUs for race and X/6 HLA match. The results were presented at the NCBI meeting in March and accepted for poster presentation at the 2010 Cord Blood Symposium.

Observational Research

- Staff continued work on various observational studies within the area of Immunobiology, GVHD and Graft Sources Working Committees. Two manuscripts were published during this reporting period.
- The 2010 Tandem meetings were held during this reporting period. All Working Committees held their annual meeting to review and prioritize studies. A total of 8 new studies were proposed for the Immunobiology, GVHD and Graft Sources Working Committees.

	Prospective Studies; RCI BMT • During this report period, follow up activities continued for donors participating in the PBSC vs. Marrow clinical trial. Staff continue to support this activity including monitoring. • Adult Double Cord trial activity during this period included four patients being enrolled for a total of twenty-eight patients accrued to this study, giving us a 51% completion rate. Staff continues to coordinate and complete monthly PI and coordinator calls, manage data collection and monitor sites. • Revlemid trial activity continued during this period. Sites continued to enroll patients onto this study using the EMMES developed data capture forms. Minor revisions to the data capture system have been identified and have or are currently being revised. • Staff established internal structure to provide a mechanism for our ability to support studies that include a need for survey research functionality.
IID.1.2 Task 2: Research with NMDP Donors	**Period 6 Activity:** • Staff continued support of a Donor Ethnicity study with Dr. Galen Switzer from the University of Pittsburgh. • Staff continued to collaborate on a COG KIR study. Activities include facilitating the collection of a donor blood sample and shipment to the study lab. • Staff continued to work on identifying and streamlining the operational processes needed to implement the protocol for long-term donor follow-up.
IID.1.3 Task 3: Expand Immuno-biology Research	**Period 6 Activity:** The CIBMTR IBWC met monthly during the quarter to discuss progress on ongoing research studies • The IBWC held the annual meeting at the BMT Tandem Meeting o Six new proposals were reviewed and accepted by the committee o Principal investigators provided updates on ongoing studies o The committee had the most productive year to date with thirteen manuscripts published or submitted for publication

	• The scientific director attended the BMT Tandem and EBMT annual meetings. • Four manuscripts were published: o Stephen Spellman, et al., *The detection of donor-directed, HLA-specific alloantibodies in recipients of unrelated hematopoietic cell transplantation is predictive of graft failure.* In press. Blood, prepublished online January 2010. o David McDermott, et al.DH., *Donor and recipient chemokine receptor CCR5 genotype is associated with survival after bone marrow transplantation.* In press. Blood, prepublished online January 2010. o Yume Nguyen, et al., *Insufficient evidence for association of NOD2/CARD15 or other inflammatory bowel disease-associated markers on GVHD incidence or other adverse outcomes in T-replete, unrelated donor transplantation*. In press. Blood, prepublished online February 2010. o Jeff Venstrom, et al., *Donor activating KIR3DS1 is associated with decreased acute GvHD in unrelated allogeneic hematopoietic stem cell transplantation.* In press. Blood, prepublished online February 2010. • One manuscript was submitted for publication: o Ann Woolfrey, et al., *HLA-C antigen mismatches are associated with worse outcomes in unrelated donor peripheral blood stem cell transplantation.* Submitted to Blood.

ACRONYM LIST

AABB	American Association of Blood Banks	IPR	Immunobiology Project Results
AFA	African American	ICRHER	International Consortium for Research on Health Effects of Radiation
AGNIS	A Growable Network Information System	IND	Investigational New Drug
AML	Acute Myelogenous Leukemia	IS	Information Services
ABD	Antigen Binding Domain	IT	Information Technology
API	Asian Pacific Islander	IRB	Institutional Review Board
ARS	Acute Radiation Syndrome (also known as Acute Radiation Sickness)	JCAHO	Joint Commission on Accreditation of Healthcare Organizations
ASBMT	American Society for Blood and Marrow Transplantation	KIR	Killer Immunoglobulin-like Receptor
ASHI	American Society for Histocompatibility and Immunogenetics	MDACC	MD Anderson Cancer Center
B-LCLs	B-Lymphoblastoid Cell Lines	MDS	Myelodysplastic Syndrome
BARDA	Biomedical Advanced Research and Development Authority	MHC	Major Histocompatibility Complex
BMT CTN	Blood and Marrow Transplant - Clinical Trials Network	MICA	MHC Class I-Like Molecule, Chain A
BRT	Basic Radiation Training	MICB	MHC Class I-Like Molecule, Chain B
C&A	Certification and Accreditation	MKE	Milwaukee
CAU	Caucasian	MSKCC	Memorial Sloan-Kettering Cancer Center
CBMTG	Canadian Blood and Marrow Transplant Group	MSP	Minneapolis
CBB	Cord Blood Bank	MUD	Matched Unrelated Donor
CBC	Congressional Black Caucus	NCBM	National Conference of Black Mayors
CBS	Canadian Blood Service	NCI	National Cancer Institute
CBU	Cord Blood Unit	NEMO	N-locus Expectation-Maximization using Oligonucleotide typing data
CHTC	Certified Hematopoeitic Transplant Coordinator	NHLBI	National Heart Lung and Blood Institute
CIBMTR	Center for International Blood & Marrow Transplant Research	NIH	National Institutes of Health

CIT	CIBMTR Information Technology	NIMS	National Incident Management System
CLIA	Clinical Laboratory Improvement Amendment	NK	Natural Killer
CME	Continuing Medical Education	NMDP	National Marrow Donor Program
CMF	Community Matching Funds	NRP	National Response Plan
COG	Children's Oncology Group	NST	Non-myeloablative Allogeneic Stem Cell Transplantation
CREG	Cross Reactive Groups	OCR/ICR	Optical Character Recognition/Intelligent Character Recognition
CSS	Center Support Services	OIT	Office of Information Technology
CT	Confirmatory Testing	OMB	Office of Management and Budget
CTA	Clinical Trial Application	ONR	Office of Naval Research
DC	Donor Center	P2P	Peer-to-Peer
DIY	Do it yourself	PBMC	Peripheral Blood Mononuclear Cells
DKMS	Deutsche Knochenmarkspenderdatei	PBSC	Peripheral Blood Stem Cell
DMSO	Dimethylsulphoxide	PCR	Polymerase Chain Reaction
DoD	Department of Defense	PSA	Public Service Announcement
DNA	Deoxyribonucleic Acid	QC	Quality control
D/R	Donor/Recipient	RCC	Renal Cell Carcinoma
EBMT	European Group for Blood and Marrow Transplantation	RCI BMT	Resource for Clinical Investigations in Blood and Marrow Transplantation
EM	Expectation Maximization	REAC/TS	Radiation Emergency Assistance Center/Training Site
EMDIS	European Marrow Donor Information System	RFP	Request for Proposal
ENS	Emergency Notification System	RFQ	Request for Quotation
ERSI	Environment Remote Sensing Institute	RG	Recruitment Group
FBI	Federal Bureau of Investigation	RITN	Radiation Injury Treatment Network
FDA	Food and Drug Administration	SBT	Sequence Based Typing
FDR	Fund Drive Request	SCTOD	Stem Cell Therapeutics Outcome Database
Fst	Fixation Index	SG	Sample Group
GETS	Government Emergency Telecommunications Service	SLW	STAR Link® Web
GCSF	Granulocyte-Colony Stimulating Factor (also	SSA	Search Strategy Advice

	known as filgrastim)		
GIS	Geographic Information System	SSO	Sequence Specific Oligonucleotides
GvHD	Graft vs Host Disease	SSP	Sequence Specific Primers
HCT	Hematopoietic Cell Transplantation	SSOP	Sequence Specific Oligonucleotide Probes
HHQ	Health History Questionnaire	STAR®	Search, Tracking and Registry
HHS	Health and Human Services	TC	Transplant Center
HIPAA	Health Insurance Portability and Accountability Act	TED	Transplant Essential Data
HIS	Hispanic	TNC	Total Nucleated Cell
HLA	Human Leukocyte Antigen	TSA	Transportation Security Agency
HML	Histoimmunogenetics Mark-up Language	UI	User Interface
HR	High Resolution	URD	Unrelated Donor
HRSA	Health Resources and Services Administration	WGA	Whole Genome Amplification
HSC	Hematopoietic Stem Cell	WMDA	World Marrow Donor Association
IBWC	Immunobiology Working Committee	WU	Work-up
IDM	Infectious Disease Markers		
IHWG	International Histocompatibility Working Group		